



U.S. Army Corps of Engineers

Final

Site-Specific Final Report

**Remedial Design/
Remedial Action**

**Munitions Response Site
N-2/New Demolition Area**

**Former Kirtland Air Force Base
Precision Bombing Ranges
West Mesa Munitions Response Area
Albuquerque, New Mexico**

FUDS Identification Number: K06NM044501

Prepared for:



**U.S. Army Corps of Engineers
Albuquerque District
4101 Jefferson Plaza NE
Albuquerque, New Mexico 87109**

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The views, opinions, and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy, or decision, unless so designated by other documentation.

APPENDIX I
MUNITIONS AND EXPLOSIVES OF CONCERN
HAZARD ANALYSIS

MEC HA Summary Information

Site ID: MRS N-2/New Demolition Area
Date: 12/16/2015

Comments

Please identify the single specific area to be assessed in this hazard assessment. From this point forward, all references to "site" or "MRS" refer to the specific area that you have defined.

A. Enter a unique identifier for the site:

MRS N-2/NDA, Former KAFB PBR, West Mesa MRA, FFID#NM657182442300

Provide a list of information sources used for this hazard assessment. As you are completing the worksheets, use the "Select Ref(s)" buttons at the ends of each subsection to select the applicable information sources from the list below.

Ref. No.	Title (include version, publication date)
1	Kirtland AFB Archives Search Report, USACE, June 1994
2	Kirtland AFB EE/CA Report, USACE, June 1994
3	Kirtland AFB Wide-Area Assessment, ESTCP, July 2008
4	Final West Mesa RI/FS Work Plan, USACE, September 2009
5	Final Former KAFB PBR N-2/New Demolition Area RI/FS Report, USACE, September 2011
6	West Mesa RI/FS Geophysical Report, PIKA, March 2010
7	Former KAFB PBR N-2/New Demolition Area Decision Document, USACE, July 2013
8	Former KAFB PBR N-2/New Demolition Area, Interim Removal Action (Surface Clearance) After Action Report, USACE, August 2012
9	Former KAFB PBR N-2/New Demolition Area, Final MetalMapper Pilot Study Plan, USACE, March 2013
10	Former KAFB PBR N-2/New Demolition Area, Final Phase 1 Digital Geophysical Mapping Work Plan, USACE, March 2013
11	Former KAFB PBR N-2/New Demolition Area, Final Phase 2 Addendum Digital Geophysical Mapping Work Plan, USACE, April 2014
12	Former KAFB PBR N-2/New Demolition Area, RD/RA Draft Site Specific Final Report, USACE, December 2015
13	U.S. Explosive Ordnance, OP 1664, 1947
14	General Ammunition, TM, Dept. of the Army, October 1969
15	NOAA Manual NOS NGS 1, 1978
16	City of Albuquerque planning documents: West Side Strategic Plan, Double Eagle II Airport Master Plan
17	Personal Communication with Utility Companies: Tri-State Generation and Transmission and City of Albuquerque Water Authority and Double Eagle II Airport
18	Western Regional Climate Center

Data collected from website: <http://www.wrcc.edu/cgi-bin/cliMAIN.pl?nm0234>

B. Briefly describe the site:

1. Area (include units):	1,252 acres	
2. Past munitions-related use:		
OB/OD Area		
3. Current land-use activities (list all that occur):		
Utility Maintenance, open space, airport		
4. Are changes to the future land-use planned?	Yes	Airport and commercial expansion

5. What is the basis for the site boundaries?

Geophysical data collected during the EE/CA Investigation in January 2005, Wide Area Assessment in July 2008, and the Remedial Investigation in 2009. This data was utilized to determine site boundaries based upon the following criteria:

1. Begin with establishing a 3000-ft radius boundary from each target feature center. Use dig results from the EE/CA, TCRA, WAA, and RI to determine where anomalies identified as MD items greater than 3-lbs fall outside or within 250 ft of the 3000-ft boundary.
2. Extend the boundary to include the MD item and a buffer of 250-ft beyond the item.
3. If an MD item greater than 3-lbs is further away, but within 250 ft of the MD, extend the boundary 250 ft beyond that item.
4. If a MD item greater than 3-lbs is discovered outside of the 250-ft buffer this MD item shall be considered an isolated incidence and not be included in the MRS boundary. In an instance where a MEC item is discovered within the 250-ft buffer area or less than 250 ft outside of the MRS boundary, the boundary will be moved to include the MEC item plus the 250-ft buffer.
5. If during subsequent phases of investigation or remedial action, items are found adjacent to or outside of the MRS boundary, the boundary will be refined. No discoveries were made during the performance of the Interim Removal Action (surface clearance) or RD/RA that required revision to the MRS boundary.

6. How certain are the site boundaries?

Relies on dependability of ground data obtained from random walk method, combined with some geophysics data obtained from Wide Area Assessment. 100% geophysical coverage not obtained and a statistical sampling of grids within the MRS conducted as part of the RD/RA. No MEC/UXO was found in grids located in 1,052 acres surrounding the target centers yielding a high degree of certainty the MRS boundaries are appropriate.

Reference(s) for Part B:

- Kirtland AFB Archives Search Report, USACE, June 1994**
- Kirtland AFB EE/CA Report, USACE, June 1994**
- Kirtland AFB Wide-Area Assessment, ESTCP, July 2008**
- Final Former KAFB PBR N-2/New Demolition Area RI/FS Report, USACE, September 2011**
- West Mesa RI/FS Geophysical Report, PIKA, March 2010**

C. Historical Clearances

1. Have there been any historical clearances at the site?

Yes, surface clearance

Yes, subsurface clearance

2. If a clearance occurred:

a. What year was the clearance performed?

2012 thru 2014

b. Provide a description of the clearance activity (e.g., extent, depth, amount of munitions-related items removed, types and sizes of removed items, and whether metal detectors were used):

Surface clearance was completed in 2012 and 2013 over approximately 234 acres at and around the target centers and 93 acres was cleared in statistically generated grids into the lower metallic anomaly density areas of the MRS surrounding the target centers. No MEC or UXO were found. Subsurface clearance was performed in 2013 and 2014 during the RD/RA. A total of approximately 199 acres at the target centers and statistically distributed grids were cleared of subsurface anomalies to a maximum depth of 6.2-feet BGS. Six (6) 100-lb high explosives were discovered and destroyed.

Reference(s) for Part C:

- Former KAFB PBR N-2/New Demolition Area, Interim Removal Action (Surface Clearance) After Action Report, USACE, August 2012**
- Former KAFB PBR N-2/New Demolition Area, RD/RA Draft Site Specific Final Report, USACE, July 2015**

Not attached, see Figures A-1 and A-2 in Appendix A

D. Attach maps of the site below (select 'Insert/Picture' on the menu bar.)

Site ID: **MRS N-2/New Demolition Area**
Date: **12/16/2015**

Cased Munitions Information

Item No.	Munition Type (e.g., mortar, projectile, etc.)	Munition Size	Munition Size Units	Mark/ Model	Energetic Material Type	Is Munition Fuzed?	Fuzing Type	Fuze Condition	Minimum Depth for Munition (ft)	Location of Munitions	Comments (include rationale for munitions that are "subsurface only")
1	Bombs	100	lb	AN-M30	High Explosive	Yes	Impact	UNK	0.1	Subsurface Only	Surface clearance was performed over the high and medium anomaly density areas of the MRS and statistically positioned grids in the low anomaly density area and no surface bombs have ever been observed during all phases of investigation and remediation of the MRS. entering "0" adversely impacts the functionality of the automated sheets.
2	Cartridge-actuated devices	5	lb	M1A1	Spotting Charge	Yes	Impact	UNK	0.1	Subsurface Only	See above
3	Pyrotechnic	25.5	lb	M8A1	Pyrotechnic	No			0.1	Subsurface Only	See Above
4	Pyrotechnic	37	lb	M24	Pyrotechnic	No			0.1	Subsurface Only	See above

Reference(s) for table above:

- Kirtland AFB Archives Search Report, USACE, June 1994
- Kirtland AFB EE/CA Report, USACE, June 1994
- Kirtland AFB Wide-Area Assessment, ESTCP, July 2008
- Final Former KAFB PBR N-2/New Demolition Area RI/FS Report, USACE, September 2011
- West Mesa RI/FS Geophysical Report, PIKA, March 2010
- Former KAFB PBR N-2/New Demolition Area, RD/RA Draft Site Specific Final Report, USACE, July 2015
- U.S. Explosive Ordnance, OP 1664, 1947
- General Ammunition, TM, Dept. of the Army, October 1969

Bulk Explosive Information

Item No.	Explosive Type	Comments
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Reference(s) for table above:

Site ID: **MRS N-2/New Demolition Area**
Date: **12/16/2015**

Activities Currently Occurring at the Site

Activity No.	Activity	Number of people per year who participate in the activity	Number of hours per year a single person spends on the activity	Potential Contact Time (receptor hours/year)	Maximum intrusive depth (ft)	Comments
1	Commercial facilities	1,662	1,047	1,739,328	0	Estimated 850 persons/square mile x 1 square mile/640 acres x 1,252 acres (10 acres used by crosswinds runway) = 1,662 persons present/day; Assumes 831 persons present every day (250 working days) + 465 persons present 1 month (20 work days)/year + 366 persons present 1 day/year Assuming each working days = 8 hours
2	Construction	200	968	193,600	10	10 structures built at one time x 15 workers/structure + 50 additional workers that work on some structures within MRS N-2/NDA but not every one, including runway; 6 months total construction period = 121 working days x 8 hours/day = 968 worker hours/year
3	Additional Double Eagle II Airport Runway	4,185	18.75	78,469	1	From Double Eagle II Airport: traffic = 479 x Projected utilization of Additional runway: 5% all Single-Engine piston craft x 365 days/year = 8,742 flights/year. Of 8,742 flights/year, estimated 4,742 flights are "repeat" fliers average 2 visits/month = 790 person flights, leaving 4,000 "unique" flights. Assumes an average of 1.5 persons/flight = 7,185 persons estimated. Average visitation of runway and facilities= 1.5 hrs. x (half of flights with 2 visits/month = 24 visits/year + 1 visit/year for other half/2 = 12.5 visits) = 18.75 hrs
4	Utility Maintenance	55	120	6,600	5	5 utility companies: (15 employees/year/company x 3 companies) + (5 employees/year/company x 2 companies); averaged in between 24 visits per year for 3 companies and 2 visits per year for 2 companies, average 8 hour visits.
Total Potential Contact Time (receptor hrs/yr):				2,017,997	Maximum intrusive depth at site (ft):	5

Reference(s) for table above:

Personal Communication with Utility Companies: Tri-State Generation and Transmission and City of Albuquerque Water Authority and Double Eagle II Airport Staff

Activities Planned for the Future at the Site (If any are planned: see 'Summary Info' Worksheet, Question 4)

Activity No.	Activity	Number of people per year who participate in the activity	Number of hours per year a single person spends on the activity	Potential Contact Time (receptor hours/year)	Maximum intrusive depth (ft)	Comments
1	Commercial facilities	1,662	1,047	1,739,328	0	Estimated 850 persons/square mile x 1 square mile/640 acres x 1,252 acres (10 acres used by crosswinds runway) = 1,662 persons present/day; Assumes 831 persons present every day (250 working days) + 465 persons present 1 month (20 work days)/year + 366 persons present 1 day/year Assuming each working days = 8 hours
2	Construction	200	968	193,600	10	10 structures built at one time x 15 workers/structure + 50 additional workers that work on some structures within MRS N-2/NDA but not every one, including runway; 6 months total construction period = 121 working days x 8 hours/day = 968 worker hours/year
3	Additional Double Eagle II Airport Runway	4,185	18.75	78,469	1	From Double Eagle II Airport: traffic = 479 x Projected utilization of Additional runway: 5% all Single-Engine piston craft x 365 days/year = 8,742 flights/year. Of 8,742 flights/year, estimated 4,742 flights are "repeat" fliers average 2 visits/month = 790 person flights, leaving 4,000 "unique" flights. Assumes an average of 1.5 persons/flight = 7,185 persons estimated. Average visitation of runway and facilities= 1.5 hrs. x (half of flights with 2 visits/month = 24 visits/year + 1 visit/year for other half/2 = 12.5 visits) = 18.75 hrs
4	Utility Maintenance	55	120	6,600	5	5 utility companies: (15 employees/year/company x 3 companies) + (5 employees/year/company x 2 companies); averaged in between 24 visits per year for 3 companies and 2 visits per year for 2 companies, average 8 hour visits.
Total Potential Contact Time (receptor hrs/yr):				2,017,997	Maximum intrusive depth at site (ft):	10

Reference(s) for table above:

City of Albuquerque planning documents: West Side Strategic Plan, Double Eagle II Airport Master Plan

Personal Communication with Utility Companies: Tri-State Generation and Transmission and City of Albuquerque Water Authority and Double Eagle II Airport

Site ID: **MRS N-2/New Demolition Area**
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Planned Remedial or Removal Actions

Response Action No.	Response Action Description	Expected Resulting Minimum MEC Depth (ft)	Expected Resulting Site Accessibility	Will land use activities change if this response action is implemented?	What is the expected scope of cleanup?	Comments
1	MEC Removal (100% anomaly excavation for high density anomaly area and the surrounding step-out area within the medium density anomaly area to 6.2-feet. 100% Surface metallic anomaly and MEC clearance for high and medium density areas, and statistically generated sampling grids in the low density area; and subsurface anomaly clearance of statistical sampling areas in the medium and low density areas to confirm that the probability of MEC remaining below the surface is adequately low to conclude no further remedial action, with physical and institutional LUCs.)	4	Full Accessibility	No	cleanup of MECs located both on the surface and subsurface	100% Geophysical Survey and subsurface MEC Removal in the high anomaly density areas of MRS only. 100% Surface MEC clearance in high and medium anomaly density areas of the MRS. Statistical sampling of all other areas of MRS to achieve 95-99% confidence that 99% of the MRS is cleared of MEC. Scope of cleanup is "cleanup of MEC located both on the surface and subsurface". Statistical sampling is conducted over medium- and low-anomaly density areas of the MRS and MEC HA guidance specifies that 100% clearance is not needed to achieve this category. Physical and institutional LUCs.

For those alternatives where you answered 'No' in Column E, are land-use activities to be assessed against current or future land uses?


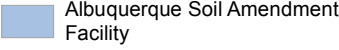
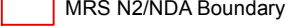
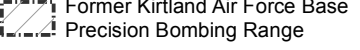

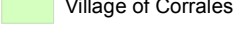
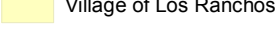
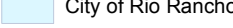
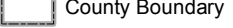
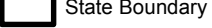
Future	"No" was chosen because the City of Albuquerque 20-year Master Plan for Double Eagle II Airport (CABQ 2002) indicates future land use will continue to be associated with Airport facilities. Two priorities stated in the Master Plan are: "Control necessary land use through zoning to permit future airfield expansion, preclude incompatible land use encroachment, and provide adequate noise buffer zones; and reserve potential aviation development areas to meet long-range aviation activity demands".
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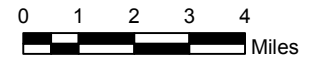
Reference(s) for table above:

Former KAFB PBR N-2/New Demolition Area Decision Document, USACE, July 2013
Former KAFB PBR N-2/New Demolition Area, RD/RA Draft Site Specific Final Report, USACE, July 2015

Figure A-1 Site (MRA) Location Map

Former Kirtland Air Force Base
Precision Bombing Range
Munitions Response Area

-  Double Eagle II Airport
-  Albuquerque Soil Amendment Facility
-  MRS N2/NDA Boundary
-  Former Kirtland Air Force Base Precision Bombing Range
-  City of Albuquerque
-  Village of Corrales
-  Village of Los Ranchos
-  City of Rio Rancho
-  County Boundary
-  State Boundary



1 in = 2 miles

Universal Transverse Mercator Projection
UTM Zone 13N (meters), NAD83

Contract: W912PP-12-C-0004

January 2015

U.S. Army Corps of Engineers
Formerly Used Defense Site
K06NM044501

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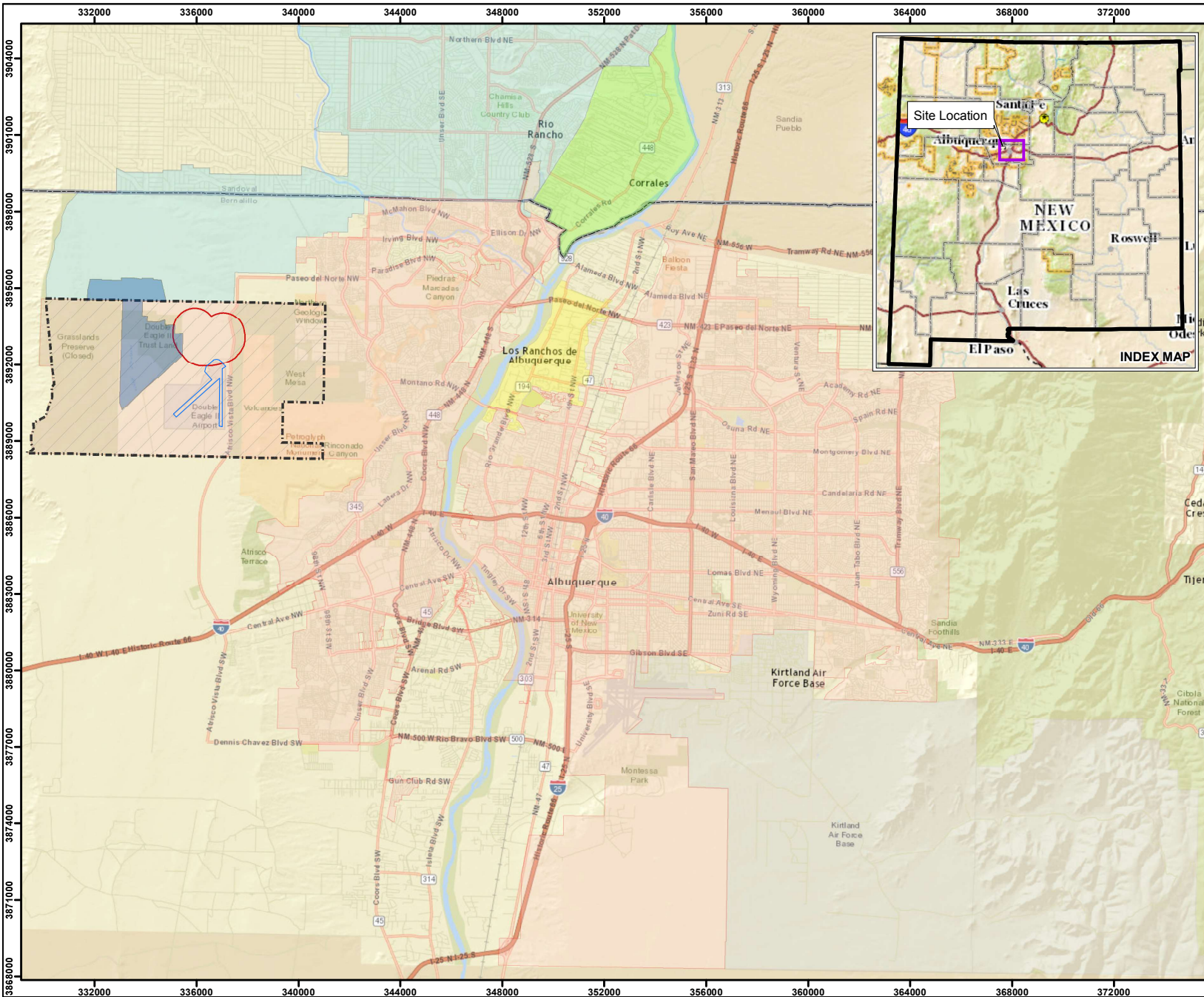
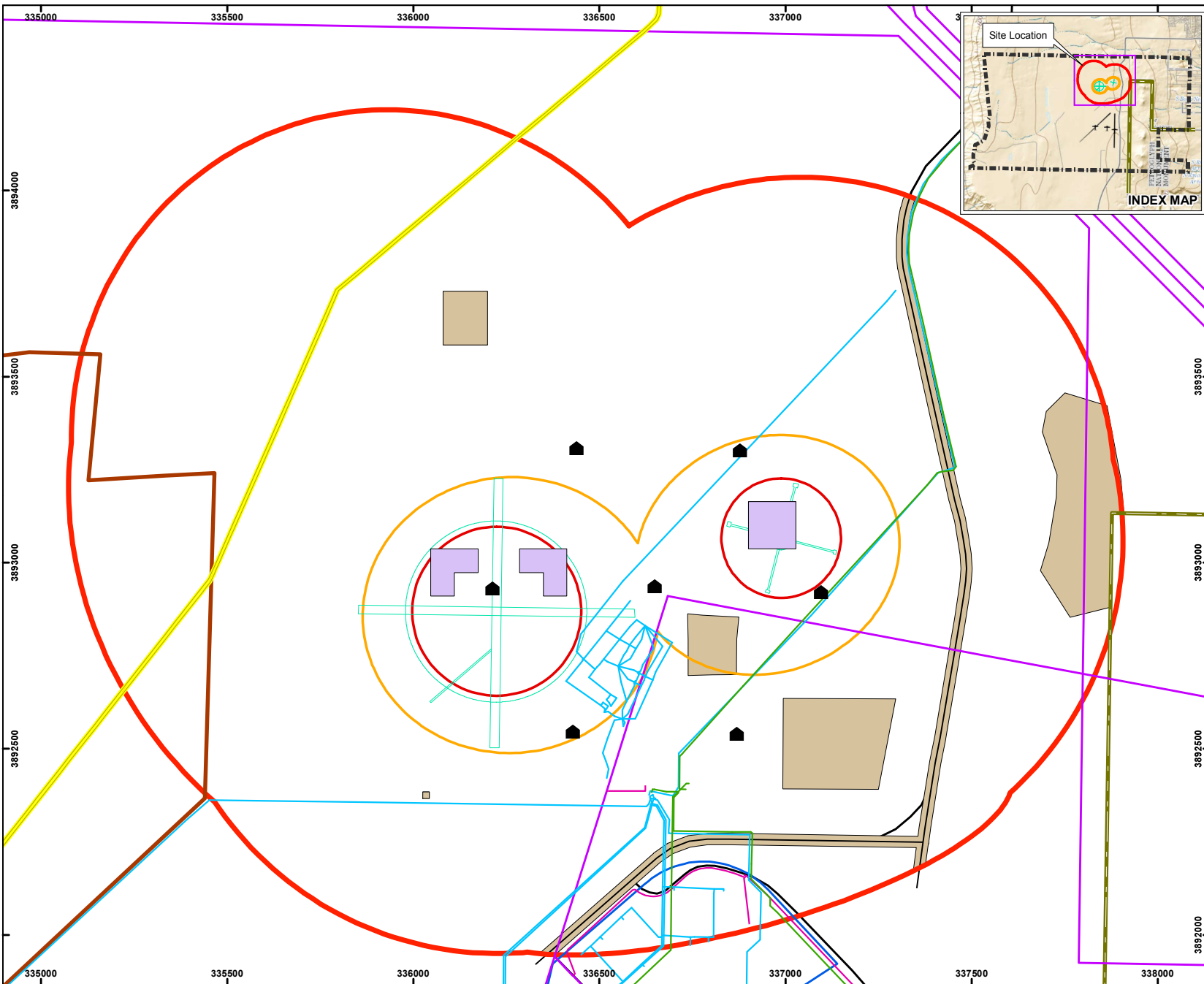
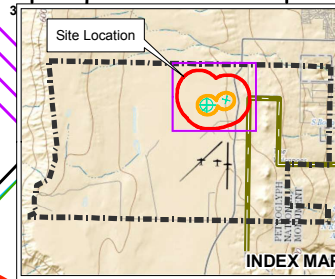
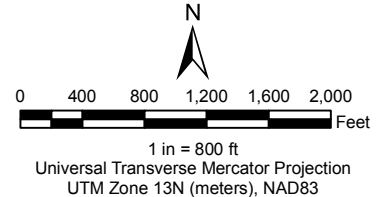


Figure A-2 MRS N-2/NDA Site Location Map

Former Kirtland Air Force Base
Precision Bombing Range
Munitions Response Area



- Building Debris Area
- Underground Utility Line
- Electric, Overhead Transmission Line (PNM)
- Gas Transmission Line (GCNM)
- Water Line (ABQ)
- Wastewater Line (ABQ)
- Road
- Double Eagle II Airport
- Petroglyph NM Boundary
- Excluded Areas
- MetalMapper Calibration Study
- Albuquerque Soil Amendment Facility
- MRS N- 2/NDA Boundary
- Medium Anomaly Density Area, >25 anom/acre
- High Anomaly Density Area, >100 anom/acre
- Former Target Feature



Contract: W912PPP-12-C-0004	February 2015
U.S. Army Corps of Engineers Formerly Used Defense Site K06NM044501	E:\Project\West_Mesal Project_31304_Task14_ Reporting\mxd\FIG_1-3_ MRSLocationMap.mxd CM

